REPTILES & AMPHIBIANS

Consumption and Dispersal of West Indian Holly (*Turnera ulmifolia*, Turneraceae) Seeds by Cuban Green Anoles, *Anolis porcatus* (Squamata: Dactyloidae)

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Photographs by the author

The Cuban Green Anole, *Anolis porcatus* Gray 1841, is an opportunistic omnivore (Henderson and Powell 2009). Its diet consists largely of insects, mainly ants, but frugivory, nectivory, saurophagy, coprophagy, and acceptance of leftovers resulting from human activities have been observed (Rodriguez Schettino 1999; Armas and Iturriaga 2019; Armas 2020, 2021a).

The West Indian Holly, *Turnera ulmifolia* L. (Turneraceae), commonly known in Cuba as Marilope, is a Neotropical perennial shrub that generally grows to heights of about 1.2 m, but can grow taller in some instances (Fig. 1); fruits are non-fleshy dehiscent capsules (Fig. 1); and seeds (mean = 56), which are covered by a fine soft layer (elaiosome) composed of lipids, proteins, vitamins, and carbohydrates, remain attached to the valves until they are detached by ants or fall naturally to the ground (Cuautle et al. 2005). Several species of ants facilitate natural dispersal of seeds (myrmecochory) (Cuautle et al. 2005; Servigne and Detrain 2008), but no lizards are known to disperse the seeds.

At 1543 h on 5 June 2021, in my backyard in San Antonio de los Baños, Artemisa Province, Cuba (22.89347°N, 82.50978°W; 75 m asl), I observed an adult female Cuban Green Anole eating the seeds of *T. ulmifolia* (Fig. 2). During the following six months, I regularly observed adults of both sexes and juveniles eating seeds from the same bush. From 25 November to 24 December 2021, I examined 34 fresh fecal pellets of those anoles and confirmed the presence of 2–93 seeds of *T. ulmifolia* per pellet (mean = 19.2 ± 18.8), including some pellets that contained only seeds or almost exclusively seeds (Fig. 3). Most fecal pellets with fewer seeds had higher numbers of ants and vice versa. Ants present in the pellets were predominantly (≥ 90%) African Big-headed Ants (*Pheidole megacephala*), the remainder were Crazy Ants (*Paratrechina longicornis*). In addition to the seeds

Fig. 1. A West Indian Holly (*Turnera ulmifolia*) (2.5 m tall) in the backyard of an urban residence in San Antonio de los Baños, Cuba, on which Cuban Green Anoles (*Anolis porcatus*) were observed eating seeds (left), a newly opened mature fruit (center), and the same fruit three days later (right).

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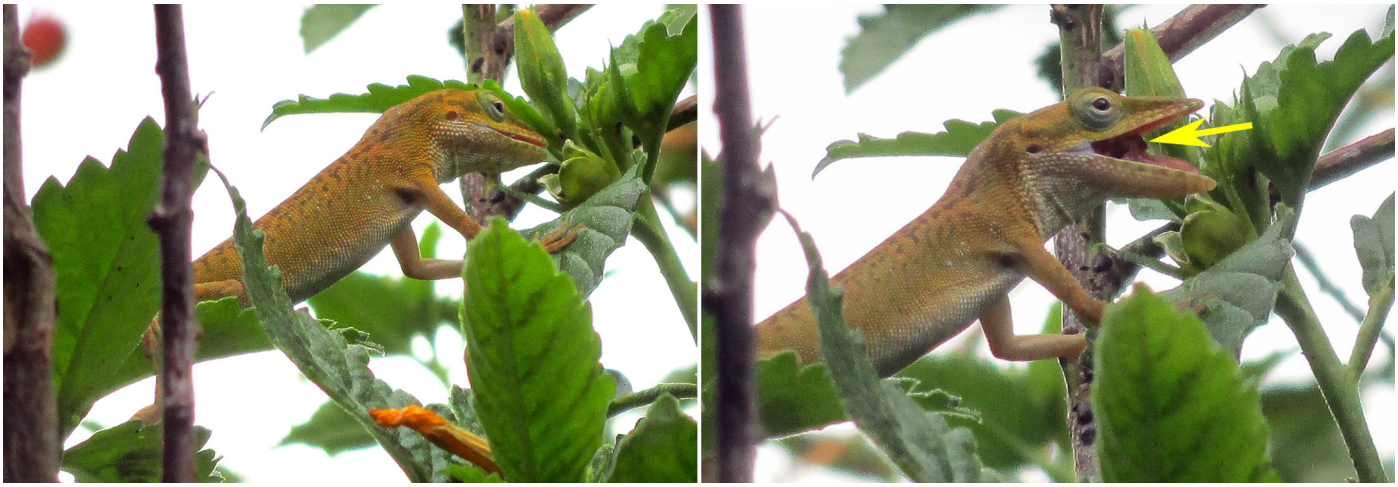

Fig. 2. A female Cuban Green Anole (*Anolis porcatus*) approaching an open fruit of a West Indian Holly (*Turnera ulmifolia*) (left) in the backyard of an urban residence in San Antonio de los Baños, Cuba, and with a seed (indicated by the arrow) in her mouth.

Fig. 3. Fecal pellets of Cuban Green Anoles (*Anolis porcatus*) containing seeds of a West Indian Holly (*Turnera ulmifolia*) consumed in the backyard of an urban residence in San Antonio de los Baños, Cuba, with 28 seeds and the remains of 15 ants (A), entirely composed of 32 seeds (B), containing 23 seeds and the remains of eight ants (C), and a very fresh pellet from an adult male (SVL ~60 mm) with 93 seeds and the remains of four ants and one small unidentified wasp (D).

and ants, seven pellets contained other prey, usually minute winged insects (Coleoptera, Hemiptera, or Hymenoptera). Nevertheless, seeds accounted for the greatest volume in most pellets.

To determine germinative potential of ingested seeds, I planted 50 seeds obtained from fecal pellets in humid soil under uncontrolled conditions in a small area of the yard. Twenty seedlings emerged (40% germination) between 14 and 23 December (17–26 days after sowing).

Although frugivory is not uncommon in anoles (Valido and Olesen 2019), this is the first report of *A. porcatus* regularly feeding on the seeds of *T. ulmifolia* and potentially functioning as a short-range dispersal agent. Because the home range of this lizard is approximately 25 m^2 (Armas 2021b; unpubl. data), dispersal of the seeds would appear to be limited (fecal pellets containing seeds were collected no more than 3.0 m from the one plant at this site).

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